

ABSTRACT

A new nonvolatile hybrid memory cell is provided. The cell is comprised of a magnetic spin storage element and one or two semiconductor FET isolation elements. The magnetic spin storage element is an electron spin-based memory element situated on a silicon based substrate and includes a first ferromagnetic layer with a changeable magnetization state, a second ferromagnetic layer with a non-changeable magnetization state, and a base layer situated between said first ferromagnetic layer and said second ferromagnetic layer. The base layer is a material having electron levels that are not significantly affected by an electron spin.